

# Chemical Storage Considerations .....

- ◆ **Dry Chemical Storage**

- ◆ Keep organic and inorganic separated

- ◆ **Liquid Chemical Storage**

- ◆ Determine major storage groups (acid, base, etc.)
- ◆ Designate separate storage for ***highly toxic*** chemicals
- ◆ Store only cleaning materials under sink

# Chemical storage requirements

- ◆ Inventory chemicals annually
- ◆ Dispose of old and unused chemicals through QE following chemical waste requirements.
- ◆ Segregate chemicals according to hazard, i.e. flammables separate from oxidizers, acids separate from bases

# Chemical Storage cont'd

- ◆ Keep containers closed unless you are working with container - do not store waste containers open with funnels in opening, do not evaporate solvents as a means of disposal.
- ◆ Ensure all containers are labeled - no abbreviations or formulae

# Safe Storage ....

- ◆ Flammable Liquids
- ◆ Corrosive Materials
- ◆ Reactive (Oxidizers and Reducers)
- ◆ Cryogenics
- ◆ Gas Cylinders

# Flammable Liquid Storage .....

- ◆ Keep quantities below allowable storage limits
- ◆ UL-approved safety cans
- ◆ Store flammable liquids in an approved storage cabinet (combined total volume of liquids not greater than 120 gallons with no more than 60 gallons of Class I or II).
- ◆ No more than 3 storage cabinets per fire area.

# Corrosive Material Storage .....

- ◆ **DO NOT** store acids and bases together
- ◆ Material should be stored in cabinets
- ◆ Store heavy containers on lower shelves
- ◆ Store on shelves with raised edges
- ◆ Do not store liquids above eye level
- ◆ ***Glacial acetic acid*** has special storage requirements-store with flammable liquids

# Reactive ....

## Oxidizer:

- ◆ Chemicals that react with other substances; can result in fire or **explosion**
- ◆ Oxidizers supply oxygen to a fire

## Water-Reactive:

- ◆ Chemicals that react with water, water vapor or moist air
- ◆ Produces a flammable or toxic gas

## Pyrophoric:

- ◆ Chemicals that ignite on contact with air
- ◆ Flame may often be invisible

# Reactive Storage ....

Segregate:

- ◆ Acids from Bases
- ◆ Acids and bases from flammables
- ◆ Pyrophoric compounds from flammables
- ◆ Perchloric acid from reducing agents
- ◆ Water from water reactive chemicals
  - ◆ Sodium/phosphorus & aqueous material - fire
  - ◆ Acid with cyanide compounds - toxic gas
  - ◆ Chlorine & ammonia - toxic chloramines
- ◆ Store thermally unstable materials in approved refrigerator



# Chemicals Requiring Special Precautions....

For chemicals with high degree of acute toxicity, select carcinogens & reproductive toxins:

- ◆ Establish designated area
- ◆ Proper storage and management
- ◆ Use engineering controls (e.g., fume hood)
- ◆ Use appropriate PPE
- ◆ Waste removal
- ◆ Decontamination procedures
- ◆ Emergency planning and response

# Cryogenic Materials .....

- ◆ Cold (e.g., Ar (-302°F), H<sub>2</sub> (-423°F), N<sub>2</sub> (-320°F), O<sub>2</sub> (-297°F)) vapors can rapidly freeze human tissue
- ◆ Produces large volumes of gas that can displace breathable oxygen
- ◆ Materials can be embrittled
- ◆ Boiling/splashing occurs when charging or filling a warm container
- ◆ Wear face shields during transfers, loose fitting, dry leather or cryogenic gloves and long pants w/o cuffs

# Gas Cylinders

- ◆ Double chain cylinder to wall/bench
- ◆ Always use a cart & safety chain when transporting cylinder
- ◆ Store flammable gas lecture bottles in flammable storage cabinet
- ◆ Keep non-compatible gases separate
- ◆ Store oxidizers 20 ft. from flammable gases